SUSQUEHANNA RIVER BASIN
TRIBUTARY TO SUMMIT LAKE CREEK
LACKAWANNA COUNTY
PENNSYLVANIA

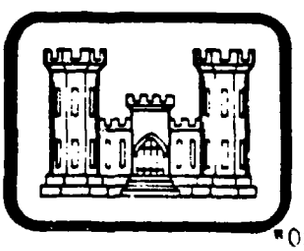
LEVEL II

INTERLAKEN DAM

NDI ID NO. PA-01037
DER ID NO. 35-087

WILLIAM P. KELLY

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM



"Original contains color plates: All DTIC reproductions will be in black and white"

DEPARTMENT OF THE ARMY
Baltimore District, Corps of Engineers
Baltimore, Maryland 21203

SUSQUEHANNA RIVER BASIN

TRIB. TO SUMMIT LAKE CREEK, LACKAWANNA COUNTY

PENNSYLVANIA

INTERLAKEN DAM

NDI ID No. PA 01037
DER ID No. 35-87

MR. WILLIAM P. KELLY

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

Prepared By:

DEPARTMENT OF THE ARMY
Baltimore District, Corps of Engineers
Baltimore, Maryland 21203

JUNE 1981

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The spillway design flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition, and the downstream damage potential.

NDI ID No. PA 01037, DER ID No. 35-87

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

CONTENTS

APPENDICES

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

BRIEF ASSESSMENT OF GENERAL CONDITION
AND
RECOMMENDED ACTION

Name of Dam: INTERLAKEN DAM
NDI ID NO. PA 01037
DER ID NO. 35-087

Size: Small (9.6 feet high; 61 acre-feet)

Hazard Classification: Significant

Owner: Mr. William P. Kelly
Clarks Summit, PA

State Located: Pennsylvania

County Located: Lackawanna

Stream: Tributary to Summit Lake Creek

Dates of Inspection: 23-24 March 1981

The visual inspection and review of available design and construction data indicate that Interlaken Dam is in poor condition. The deteriorated condition of the spillway, the inadequate spillway capacity and the adjacent breached and low areas of the embankment are the primary deficiencies which cause concern for the safety of this facility. In accordance with the recommended guidelines, the spillway design flood (SDF) for this facility is in the range of the 100 year flood to 1/2 the Probable Maximum Flood (PMF). Based on the size of the dam and degree of downstream hazard, the selected SDF is the 100 year flood.

The hydrologic and hydraulic computations indicate that the combination of reservoir storage and spillway discharge capacity will not pass the SDF prior to overtopping the embankment. In accordance with the criteria outlined and evaluated in Section 5.5, the spillway for Interlaken Dam is considered to be inadequate.

The following recommendations should be implemented by the owner without delay:

a. Necessary remedial measures should be implemented under the guidance of a qualified engineer to repair the deteriorated spillway and fill in the adjacent breached and low areas of the embankment. In addition, the spillway capacity should be made adequate and an upstream closure should be provided on the outlet works.

b. The trees and brush should be cleared from the embankment under the guidance of a qualified engineer.

c. A formal surveillance and downstream emergency warning system should be developed for use during periods of heavy or prolonged precipitation.

d. An operation and maintenance manual or plan should be prepared for use as a guide in the operation and maintenance of the dam during normal and emergency conditions.

e. A schedule of regular inspection by a qualified engineer should be developed.

APPROVED BY:

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS

JAMES W. PECK
Colonel, Corps of Engineers
Commander and District Engineer

DATE: 28 JUL 81

INTERLAKEN DAM

OVERVIEW

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

INTERLAKEN DAM

NDI ID No. PA 01037

DER ID No. 35-087

SECTION 1

PROJECT INFORMATION

1.1 General

a. Authority. The Dam Inspection Act, Public Law 92-367, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a program of inspection of non-federal dams throughout the United States.

b. Purpose. The purpose of this inspection is to determine if the dam constitutes a hazard to human life and property.

1.2 Description of Project.

a. Description of Dam and Appurtenances. Interlaken Dam is an earthfill structure approximately 9.0 feet high and 425 feet in length (including spillway). The spillway is an uncontrolled broadcrested weir located approximately 200 feet from the right abutment, and has a length of 30 feet between two concrete walls. A concrete apron is located immediately downstream of the spillway. The outlet works consists of a 12 inch terra cotta pipe with a gate valve at the downstream toe.

Note: The U.S.G.S. 7.5 minute Quadrangle Sheet (Scranton, PA.) indicates a reservoir elevation of 1341.0, which is used as the spillway crest elevation for this report.

b. Location: South Abington Township, Lackawanna County, Pa.

U.S.C.S. Quadrangle - Scranton, Pa.

Latitude 41° 28'; Longitude 75° 42.7'

Refer to Plates I & II, App. E.

c. Size Classification: Small: Height-9.6 feet, Storage 61 acre feet

d. Hazard Classification: Significant (Refer to Section 3.1.e)

e. Ownership: Mr. William P. Kelly
RD 3, Box 305
Clarks Summit, Pa. 18411

f. Purpose: Recreation

g. Design and Construction History:

The dam was designed by W. H. Bircher and W. V. Devereaux. Construction was completed in 1928. During construction, the spillway location was changed to its present position, and a concrete cap was added to the spillway crest. In 1930, the spillway walls were raised to develop a total spillway depth of 3 feet.

h. Normal Operating Procedure

At the time of inspection, normal flow was passing through a breach located immediately adjacent to the right spillway wall. Flow also was passing under the spillway cap. The owner has been requested by PennDER to draw the reservoir down until such time as this condition can be corrected.

1.3 Pertinent Data

a. Drainage Area (square miles)

From files:	0.57
Computed for this report:	0.40
Use:	0.40

b. Discharge at Damsite (cubic feet per second)

Maximum known flood	unknown
Outlet works with maximum pool (El. 1342.7)	unknown
Spillway with maximum pool (El. 1342.7)	190

c. Elevations (feet above mean sea level)

Top of Dam	
Design	Unknown
Existing Low Point (Breach Area)	1339.7
Assumed top of dam (top of left spillway wall)	1342.7
Normal pool (existing breach)	1339.7
Spillway Crest	
Design	Unknown
Existing	1341.0
Outlet Works	
Upstream invert	Unknown
Downstream invert	Unknown
Streambed at toe	1333.1

d. Reservoir Length (feet)

Normal pool (El. 1339.7)	2000
Spillway crest (El. 1341.0)	2100
Assumed Max. Pool (El.1342.7)	2200

e. Storage (acre-feet)

Normal pool (El. 1339.7)	39
Spillway crest (El. 1341.0)	43
Assumed Max. Pool (El.1342.7)	61

f. Reservoir Surface (acres)

Normal pool (El. 1339.7)	9.5
Spillway crest (El. 1341.0)	10.0
Assumed Max. Pool (El.1342.7)	10.5

g. Dam

Note: Refer to plates in Appendix E for plans and sections

Type	Earthfill with concrete corewall
Length	425 feet including spillway
Top Width	6 feet
Height	6.6 feet - low point of breach to downstream toe 9.6 - Assumed top of dam to downstream toe.
Side Slopes	
Upstream	Varies, 1V:1.5H above spillway crest; 1V:5H below
Downstream	Varies, 1V:2H right end to 1V:2.7H left
Zoning	None
Cutoff	Corewall
Grouting	None

h. Outlet Works

Type	12-inch terra cotta pipe through embankment
Closure	Valve located at downstream toe

i. Spillway

Type	Broad-crested rectangular concrete weir
Location	Center of dam
Length	30 feet
Crest Elevation	1341.0 m.a.l.
Freeboard	0 feet (existing low point) 1.7 feet (assumed TOD)
Approach Channel	Reservoir
Downstream Channel	Grouted riprap apron to rock and earth channel

SECTION 2

ENGINEERING DATA

2.1 Design.

The available data for Interlaken Dam consist of files provided by PennDER. Information available includes a permit application report with a general description of the design of the facility, PennDER inspection reports and various related correspondence. Drawings which provide cross-sections and details of the dam are also available. The reference datum for these design drawings is unknown.

2.2 Construction.

Information concerning construction of the dam is limited to the correspondence contained in the PennDER files which indicated that the dam was built in general accordance with the plans.

2.3 Operation.

No formal records of operation or maintenance exist. The owner has been directed by PennDER to keep the reservoir drawn down to prevent flow from continuing to erode a breach area adjacent to the right spillway wall.

2.4 Evaluation.

a. Availability. All available written information was contained in the permit files provided by PennDER.

b. Adequacy. The available data, including that collected during the recent detailed visual inspection, are considered to be adequate to make a reasonable assessment of the dam.

SECTION 3

VISUAL INSPECTION

3.1 Observations.

a. General. The overall appearance and general condition of the dam and appurtenances are poor. The embankment is breached for a width of five feet adjacent to the right spillway wall. This and other noteworthy deficiencies are discussed below. The visual inspection checklist, field sketch and profile are provided in Appendix A. Photographs taken during the inspection are reproduced in Appendix C.

The reservoir pool was approximately 1.2 feet below spillway crest and 0.1 foot above the bottom of the breach on the day of the initial inspection. Present during part of this inspection were Mr. William P. Kelly, owner, and Mr. John Chernesky of Pennsylvania Department of Environmental Resources.

On the day of the review inspection, the pool was being drawn down as requested by PennDER on 26 March 1981. This request was made as a result of the initial inspection.

b. Embankment. The horizontal alignment of the six foot wide crest is good. The crest is low adjacent to both spillway walls, and the left end of the crest is about one foot higher than the right. The low spot adjacent to the right spillway wall is the result of a five foot wide breach in the embankment. At the bottom of this breach is the top of the 18 inch thick concrete corewall. Flow through this opening has eroded the embankment on the downstream side of the corewall to a depth of about two feet below the top of corewall. Another low spot adjacent to the left spillway wall is about 0.8 foot below the top of the wall. The entire embankment except for the upstream slope below spillway crest is covered with trees and brush. Riprap comprised of flat stones with a median dimension of 8 inches covers the upstream face below spillway crest elevation. Although the riprap is sparse in some areas, there is no erosion occurring except at the breached section. The upstream slope varies from about 1V:1.5H above the riprap to 1V:5H below. The downstream slope varies from about 1V:2H right of the spillway to 1V:2.7H left of the spillway. Except for the breached section, the slopes appear stable with no erosion or sloughing. The toe area is wet and rutted due to a partial thaw and the movement of logging equipment.

c. Appurtenant Structures. According to the PennDER inspection report, the outlet works consists of a twelve-inch terra-cotta pipe through the corewall. An upstream valve box was proposed; however, a four foot square brick pit was located near the toe of the dam in line with the right spillway wall. The pit is filled with debris which was probed, but no valve was found during the initial inspection. The discharge end of the pipe is not visible; however, flow can be seen existing at various locations along the rock culvert. When the review inpsection was made, the top of the valve was visible in the pit, and had recently been operated satisfactorily.

The spillway is located near the center of the dam. The crest consists of a 16 inch high by 18 inch wide concrete cap on the corewall. This cap is cracked and leaning downstream. Water is flowing under the cap near its right end at the rate of approximately 2 gallons per minute. The concrete spillway walls are severely deteriorated. The upstream wingwall on the right side has partially collapsed. The remaining portion of the wall adjacent to the crest is precariously balanced on a narrow piece of concrete. The adjacent breach through the embankment has removed any lateral support for the wall. It is apparent that the right wall was raised in the past since large slabs of concrete are cracking along regular horizontal lines which appear to be joints. The upstream wingwall on the left side has cracked at the crest and settled six inches. The discharge channel immediately downstream of the weir is a concrete slab which was placed over riprap. The concrete is cracked and is being undermined along the edges. This slab is initially the same width as the weir but narrows immediately and all flow is directed into a 3.5 foot high by 4 foot wide rock culvert. Flows in excess of the capacity of this culvert flow over the dirt road at the toe of the dam causing some erosion. This erosion would not be sufficient to threaten the safety of the dam.

d. Reservoir. The wooded reservoir slopes are moderate and appear stable. Logging operations are being conducted within the watershed.

e. Downstream Channel. Immediately downstream of the dam the channel is cut in earth with light woods along the banks. Flows from Interlaken dam joins Summit Lake Creek approximately 500 feet downstream of the dam. A large concrete culvert then conducts the flow under Pennsylvania Route 307 about 300 feet further downstream. Two private residences are located in the floodplain of Summit Lake Creek approximately 1,400 feet downstream of Interlaken Dam. The first floor (damage level) of the first residence encountered is nine feet above the streambed. The damage level for the second house is 6 feet above the stream channel. It is judged that failure of Interlaken Dam would create a potential hazard for property damage and the loss of a few lives. For the next 3,000 feet the floodplain is considerably wider and the channel slope is flatter. Summit Lake Creek flows into Maple Lake, DER No. 35-27, approximately 0.9 miles downstream from Interlaken Dam. The next 0.5 mile of channel is a steep gorge within which LaRue Dam, DER No. 35-28, is located. Both this structure and Maple Lake Dam are less than 20 feet high with small amounts of storage. These dams would not be seriously affected by failure of Interlaken Dam. Summit Lake Creek passes under U.S. Route 11 and joins Leggetts Creek 1.5 miles downstream of the dam. A significant hazard classification is appropriate for Interlaken Dam.

f. Evaluation. The breach that has occurred adjacent to the spillway causes concern for the safety of dam. Continued erosion of the embankment, especially on the downstream side of the corewall, could eventually cause failure of the dam. Repair of this area would also require rehabilitation of the adjacent spillway wall. It is doubtful that, in its present condition, this wall would support the adjacent earthfill without collapsing into the spillway. The remainder of the spillway requires considerable rehabilitation. The trees and brush should be cleared from the embankment.

SECTION 4

OPERATIONAL PROCEDURES

4.1 Normal Operating Procedure. The pool level is currently maintained at the low point of the breached section. Inflow is passing thru the breached area and eroding portions of the downstream face of the embankment. The low point of the breached area is 1.3 feet below the spillway crest (elevation 1341.0). On March 26, 1981 it was requested by PennDER that the lake be drawn down. No formal operating manual exists.

4.2 Maintenance of Dam. The condition of the dam as observed by the inspection team is indicative of a general lack of maintenance. It appears that no maintenance has been performed in the recent past. A breach section has developed in the embankment. In addition, the embankment has a heavy growth of trees and brush. The spillway has significant wall displacement with severe cracking. The concrete cap on the spillway is leaking. No formal maintenance manual exists.

4.3 Maintenance of Operating Facilities. The outlet works consists of a 12 inch terra-cotta pipe through the dam with a downstream closure valve. The valve was operating satisfactorily during the review inspection.

4.4 Warning System. No formal warning system exists.

4.5 Evaluation. The breached area and spillway are areas that should be repaired immediately. Routine maintenance of the facility should include removal of trees, brush, and high weeds. Formal manuals of maintenance and operation are recommended to ensure that all needed maintenance is identified and performed regularly. In addition, a formal warning system for the protection of downstream inhabitants should be developed. Included in the plan should be provisions for around-the-clock surveillance of the facility during periods of unusually heavy precipitation.

SECTION 5

HYDROLOGIC/HYDRAULIC EVALUATION

5.1 Design Data. No formal design reports or calculations are known to exist for the facility. A design drawing showing embankment, spillway and reservoir area details is located in the PennDER files and is shown in Appendix E of this report.

5.2 Experience Data. Records of reservoir levels and/or spillway discharges are not available.

5.3 Visual Observations. On the date of the inspection, the breached section of the embankment had flow over it. This condition caused concern for the safety of the dam and it was requested that the lake be drawn down. The breach and low areas should be filled in. In addition, the spillway walls and cap are in need of repair. See field sketch in Appendix A and photographs in Appendix C for a better description of the facility.

5.4 Method of Analysis. The facility has been analyzed in accordance with procedures and guidelines established by the U.S. Army Corps of Engineers, Baltimore District, for Phase I hydrologic and hydraulic evaluations.

5.5 Summary of Analysis.

a. Spillway Design Flood (SDF). In accordance with the procedures and guidelines contained in the National Guidelines for Safety Inspection of Dams for Phase I Investigations, the SDF for Interlaken Dam ranges between the 100 year flood and one-half the Probable Maximum Flood (PMF). This classification is based on the relative size of the dam (small) and the potential hazard of dam failure to downstream development (significant). Due to the small storage (61 ac-ft) and height (9.6 feet), the SDF selected was the 100 year flood.

b. Results of the Analysis. The 100 year flood peak is derived by averaging the peak flow value obtained from two regression equations. The first regression equation is from Bulletin 13, Floods in Pennsylvania, Water Resources Bulletin. Guidelines are provided to determine the peak value by use of regional statistical data. The second regression equation is from the Hydrologic Study, Tropical Storm Agnes, North Atlantic Division, U.S. Army Corps of Engineers, 1975. Guidelines are provided to determine the flood peak by use of map coefficients and logarithmic equations. The following results are obtained.

100 year flood peak	CFS
Bulletin 13 -	285
North Atlantic Division - Tropical Storm Agnes	640
Average 100 year flood peak	460

To determine the adequacy of the spillway, the average value for the 100 year flood is compared against the maximum outflow at low point top of dam. If the maximum outflow exceeds the 100 year average peak value derived above, then the spillway is rated adequate. If, however, the 100 year average peak value exceeds the maximum outlfow at low point top of dam, the spillway is rated inadequate. Results are as follows.

	CFS
Maximum Outflow at low point top of dam -	190
Average 100 year flood peak -	460

5.6 Spillway Adequacy.

Under existing conditions, the spillway cannot pass the 100 year flood peak value. Since this structure cannot pass the selected SDF (100 year flood), the spillway is rated inadequate.

SECTION 6

STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

(1) Embankment. Interlaken Dam is a brush and tree covered embankment that is in poor condition. The dam contains an 18 inch thick concrete corewall which is exposed in a breach of the embankment at the right spillway wall. At the corewall, the breach measures 5 feet wide by 3.5 feet deep. Embankment material at the breach is visually classified as a fine silty sand and appears to erode easily. Water discharges through the breach before reaching the spillway weir since the corewall elevation is 1.3 feet lower than the spillway crest. Downstream of the corewall the breach section is 6 feet deep by an average of 7 feet wide. Water that flows through this breach ponds on the road at the toe in rutted areas, keeping the area soft and wet. Water then flows from the toe area into the discharge channel. The embankment has a 6 foot wide crest, upstream slopes of 1.5H:1V, and the downstream slope from 2H:1V right of the spillway to 2.7H:1V left of the spillway. The upstream slope appears to be lightly riprapped with 8 inch rock.

(2) Appurtenant Structures. The 30 foot long spillway is a deteriorated concrete structure. The walls are cracked and broken. A portion of the upstream right spillway wall is laying in the breach area. Much of the right spillway wall is exposed due to the embankment breach. Immediately downstream of the spillway the discharge channel is riprapped and grouted with a concrete cap. A 4 x 4' brick lined pit containing a valve for the outlet works is located at the downstream end of the right spillway wall.

b. Design and Construction Data

(1) Embankment. PennDER files contain a report on the permit application, a design drawing, and a modified design drawing that show a plan and cross-sections. W. H. Bircher and W. V. Devereaux are listed as the design civil engineers. The embankment was designed to have a crest width of 10 feet and upstream and downstream slopes of 2H:1V. A revised drawing, Feb. 3, 1926, indicates that the corewall crest would follow the contour of the ground; however, a drawing submitted in 1928 indicates that the corewall crest is level.

(2) Appurtenant Structures. The 1926 design data indicated that a 30 foot long spillway would be located approximately 70 feet from the left abutment of the dam. Additionally, an outlet works was to be located approximately 200 feet from the left abutment. The outlet works was to consist of an 8 inch cast iron pipe encased in 12 inches of concrete and have a valve upstream of the corewall.

Changes were made during construction that were noted in a 1927 PennDER inspection. The spillway location was moved adjacent to the outlet works, approximately 200 feet from the left abutment. The spillway weir crest was reported to be the top of the corewall; however, a 1928 photograph shows that a 1.3 foot concrete cap, as measured during this inspection, was placed on the corewall in the spillway. A twelve inch terra cotta pipe reportedly was used as the outlet works pipe, and the valve location was now at the downstream toe of the dam.

c. Operating Records. None.

d. Post Construction Changes. The height of the spillway walls was increased around 1930 to produce a spillway depth of 3 feet.

e. Seismic Stability. The dam is located in Seismic Zone 1. Based on visual observations, the dam is considered statically stable. Therefore, the seismic stability is considered adequate. However, if embankment erosion at the breach is allowed to continue, exposing more corewall, the stability condition will change.

SECTION 7

ASSESSMENT AND RECOMMENDATIONS

7.1 Dam Assessment.

a. Safety. The visual inspection and review of available design and construction data indicate that Interlaken Dam is in poor condition. The deteriorated condition of the spillway, the inadequate spillway capacity and the adjacent breached and low areas of the embankment are the primary deficiencies which cause concern for the safety of this facility. In accordance with the recommended guidelines, the spillway design flood (SDF) for this facility is in the range of the 100 year flood to 1/2 the Probable Maximum Flood (PMF). Based on the size of the dam and degree of downstream hazard, the selected SDF is the 100 year flood.

The hydrologic and hydraulic computations indicate that the combination of reservoir storage and spillway discharge capacity will not pass the SDF (100 year flood) prior to overtopping the embankment. In accordance with the criteria outlined and evaluated in Section 5.5, the spillway for Interlaken Dam is considered to be inadequate.

b. Adequacy of Information. The design and construction data contained in PennDER files, in conjunction with data collected during the recent visual inspection, are considered to be adequate for making a reasonable assessment of this dam.

c. Urgency. The recommendations presented below should be implemented without delay.

d. Necessity for Additional Studies. The results of this inspection indicate a need for additional investigations by a qualified engineer to determine remedial measures required for the spillway structure.

7.2 Recommendations.

a. Necessary remedial measures should be implemented under the guidance of a qualified engineer to repair the deteriorated spillway and fill in the adjacent breached and low areas of the embankment. In addition, the spillway capacity should be made adequate and an upstream closure should be provided on the outlet works.

b. The trees and brush should be cleared from the embankment under the guidance of a qualified engineer.

c. A formal surveillance and downstream emergency warning system should be developed for use during periods of heavy or prolonged precipitation.

d. An operation and maintenance manual or plan should be prepared for use as a guide in the operation and maintenance of the dam during normal and emergency conditions.

e. A schedule of regular inspection by a qualified engineer should be developed.

APPENDIX A

CHECKLIST - VISUAL INSPECTION

Check List
Visual Inspection
Phase 1

Name Dam Interlaken DER No. 35-087 County Lackawanna State Pennsylvania

Date(s) Inspection 23-24 Mar 81 Weather Ptly Cloudy Temperature 40's

Pool Elevation at Time of Inspection 1339.8 M.S.L. Tailwater at Time of Inspection 1333.2 M.S.L.

A1

Inspection Personnel:

J. Bianco, C.O.E.
B. Cortright, C.O.E.
J. Evans, C.O.E.
E. Hecker, C.O.E.
J. Chernesky, PennDER
Mr. Wm. Kelly, owner

B. Cortright Recorder

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS
Any Noticeable Seepage	1-2 gpm under spillway cap. Toe area wet; apparent cause is partial thaw and movement of logging equipment.
Junction of Embankment with: Abutments Spillway	Abutments - Good Spillway - 3.5 foot deep by 6 foot wide breach behind right spillway wall. Corewall exposed. Low behind left wall.
Surface Cracks	None.
Crest Alignment: Vertical Horizontal	Vertical - Breached @ right spillway wall; low @ left wall. Left end higher than right. Horizontal - Good.
Unusual Movement or Cracking at or beyond the Toe	None. Area disturbed by movement of logging equipment.

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS
Sloughing or Erosion: Embankment Crest/Slopes Abutment Slopes	Embankment - Breach behind right spillway wall; eroded to corewall. Abutments - None.
Riprap	Riprap up to spillway crest elevation; fair condition.
Staff Gage and Recorder	None.
Instrumentation	None.
Miscellaneous	Entire embankment covered with trees and brush.

OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS
Intake Structure	Not observed.
Outlet Conduit	Not observed.
Outlet Structure	Outlet not found; apparently buried.
Emergency Gate	Gate valve located in brick pit at toe of dam. Covered with debris.
Outlet Channel	Assumed to be original streambed.

SPILLWAY

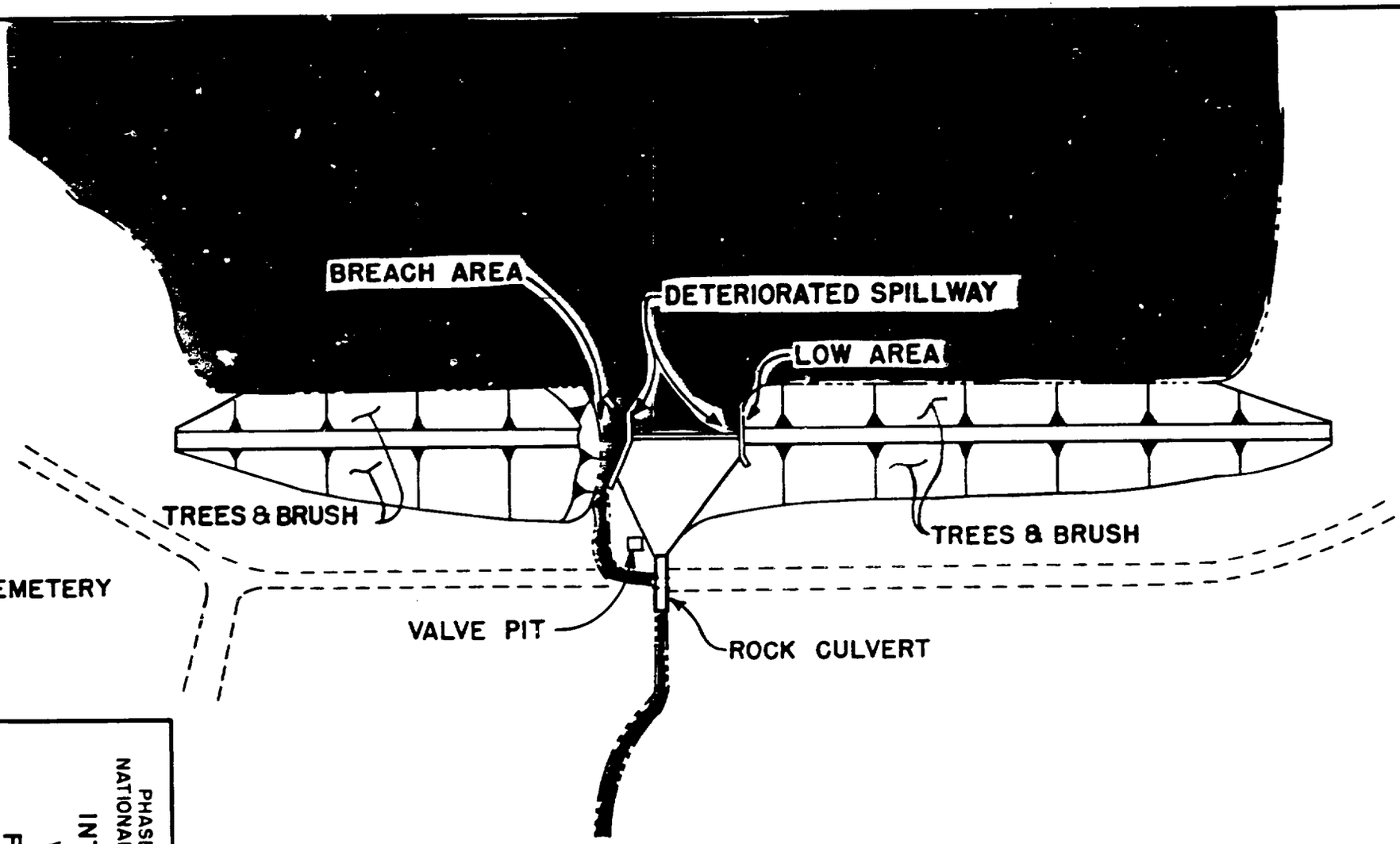
VISUAL EXAMINATION OF	OBSERVATIONS
Approach Channel	Reservoir; no obstructions.
Concrete Weir and Walls	Concrete cap on crest; cracked and leaning downstream. Seepage under cap. Walls broken and ready to collapse.
Bridge and Piers	None.
Discharge Channel	Concrete over riprap immed. d/s of weir. Undermined with cracking. Three foot by four foot rock culvert carries flow under dirt roadway adjacent to toe.

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS
Slopes	Wooded with moderate slopes. Appear stable No residential development.
Sedimentation	None.

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS
Condition: Obstructions, Debris, etc.	Earth channel with trees in floodplain on right. Large highway culvert (Pa. Rte 307) 800 feet d/s. Maple Lake (35-27) 0.9 miles d/s of dam. U.S. Route 11 is 1.5 miles d/s.
Slopes	Flat to moderate to Maple Lake; then steep through narrow gorge to just u/s Rte 11.
Approximate Number of Homes	Two homes within 1,400 feet of dam. First home has damage elevation 9 feet above streambed. Second house 7 feet above streambed.



NOT TO SCALE

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

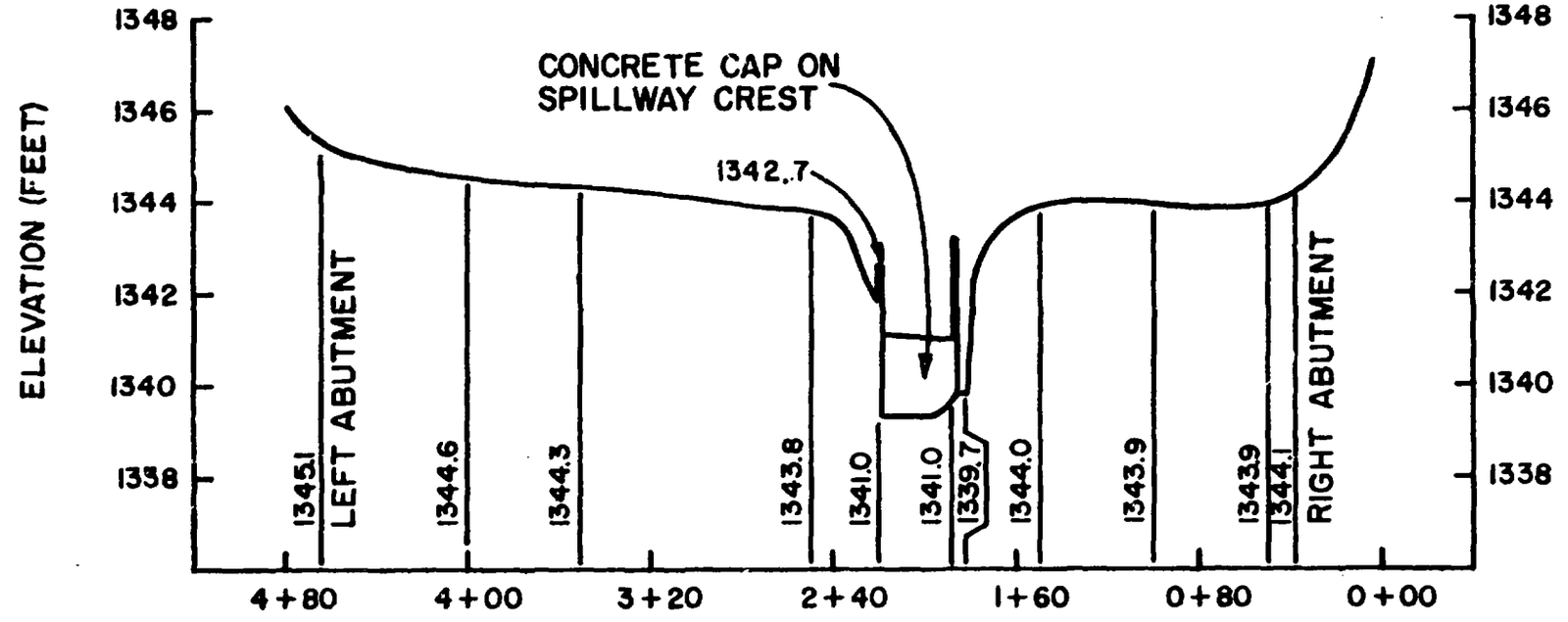
INTERLAKEN DAM

WILLIAM P. KELLY

FIELD SKETCH

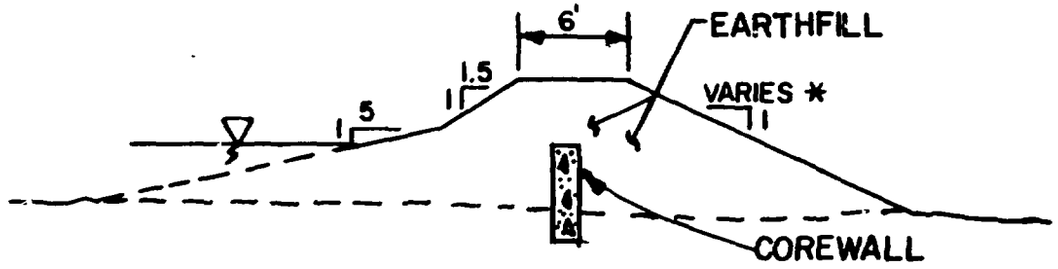
JULY 1981

EXHIBIT A-1



TOP OF DAM - PROFILE

SCALE - HORIZ.: 1 IN. = 80 FT.
VERT.: 1 IN. = 4 FT.



SECTION

SCALE: 1 IN = 10 FT

* IV : 2.0H, RIGHT SIDE
IV : 2.7H, LEFT SIDE

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

INTERLAKEN DAM

WILLIAM KELLY

PROFILE AND SECTION

JULY 1981

EXHIBIT A-2

APPENDIX B

CHECKLIST - ENGINEERING DATA

Check List
Design, Construction, Operation

NAME OF DAM - INTERLAKEN DAM
ID# - 70-35-087

ITEM	REMARKS
As-built Drawings	One Design Drawing showing embankment profile, cross-section and reservoir area, in Appendix E of this report.
Regional Vicinity Map	U.S.G.S. Scranton, PA., Quadrangle, 7-1/2 minute quad sheet. See Appendix E, Plate E-II.
Typical Sections of Dam	Shown in Appendix E of this report.
Outlets - Plan Details Constraints Discharge Ratings	Location, size, and type of outlet was changed from that shown on Design Drawing. Changes are noted in Section 6 of this report.
Rainfall/Reservoir Records	None.

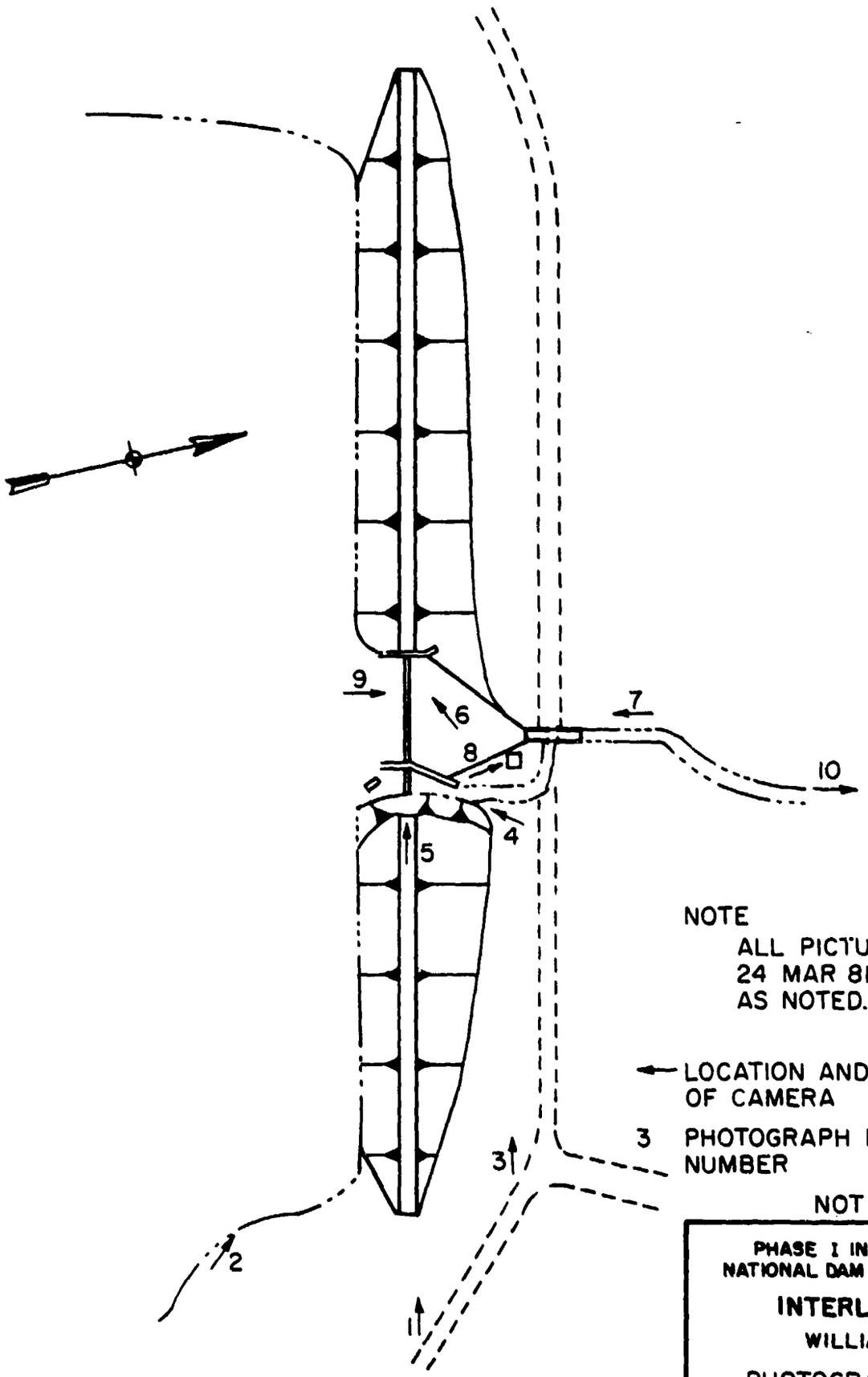
ITEM	REMARKS
Design Reports	None.
Geology Reports	None.
Design Computations Hydrology & Hydraulics Dam Stability Seepage Studies	None.
Materials Investigations Boring Records Laboratory Field	None.
Post-Construction Surveys of Dam	None.
Borrow Sources	No data.

ITEMS	REMARKS
Monitoring Systems	None.
Modifications	Height of spillway walls was increased in 1930 to produce a spillway depth of 3 feet.
High Pool Records	None.
Post-Construction Engineering Studies and Reports	None.
Prior Accidents or Failure of Dam Description Reports	N/A
Maintenace Operation Records	None.

ITEM	REMARKS
Spillway Plan Sections Details	Shown on Design Drawing, See Appendix E of this report for Plan of Spillway.
Operating Equipment Plans & Details	N/A.
Specifications	None.
Miscellaneous	PennDER Inspection Reports and photographs of facility are in PennDER files.

APPENDIX C

PHOTOGRAPHS



NOTE

ALL PICTURES TAKEN
24 MAR 81 EXCEPT
AS NOTED.

← LOCATION AND ORIENTATION OF CAMERA

3 PHOTOGRAPH IDENTIFICATION NUMBER

NOT TO SCALE

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

INTERLAKEN DAM

WILLIAM P. KELLY

PHOTOGRAPH LOCATION PLAN

JULY 1981 EXHIBIT C-1

1. Crest near right abutment.

2. Upstream face.

3. Downstream face.

4. Breach area adjacent to right spillway wall.

5. Breach area and spillway crest.

6. Left spillway wall and crest.

7. Spillway crest and discharge apron.

8. Valve pit. Top of valve stem visible in center of picutre. (20 May 81)

9. Discharge channel with rock culvert in foreground.

10. PA. Route 307 highway culver. (800 feet u/

11. First downstream residence.

APPENDIX D

HYDROLOGY AND HYDRAULICS

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE _____

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS INTERLAKEN DAM SHEET 1 OF _____ SHEETS

COMPUTED BY JPB CHECKED BY _____ DATE 4-8-81

DAM CLASSIFICATION:

SIZE OF DAM - SMALL
HAZARD - SIGNIFICANT
REQUIRED SDF 100 YEAR FLOOD TO ½PMF

DAM STATISTICS:

HEIGHT OF DAM -	6.6 FEET
STORAGE AT NORMAL POOL -	39 AC-FT.
STORAGE AT TOP OF DAM (ASSUMED)	61 AC.-FT.
DRAINAGE AREA ABOVE DAMSITE -	0.40 mi^2

ELEVATIONS: (MSL)

TOP OF DAM LOW POINT (FIELD) -	1339.7
NORMAL POOL (EXISTING BREACH) -	1339.7
STREAMBED AT TOE OF DAM -	1333.1
SPILLWAY CREST -	1341.0

HYDROGRAPH PARAMETERS:

RIVER BASIN - SUSQUEHANNA RIVER BASIN
ZONE - 11
SNYDER COEFFICIENTS:

$C_p = 0.62$
$C_t = 1.50$

MEASURED PARAMETERS: *

L = LENGTH OF LONGEST WATERCOURSE $L = 4500'$ (0.85 mi)
L_{CA} = LENGTH OF LONGEST WATERCOURSE TO CENTROID OF THE BASIN $L_{CA} = 2400'$ (0.45 mi)

* FROM U.S.G.S. QUAD SHEET ENTITLED SCRANTON, PA., 7½ MINUTE SERIES SCALE 1:24000

NADB FORM 1232, 26 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE _____

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS INTERLAKEN DAM SHEET 2 OF _____ SHEETS

COMPUTED BY JPB CHECKED BY _____ DATE 4-13-81

NOTE: ELEVATIONS ARE REFERENCED TO U.S.G.S. QUAD SHEET ENTITLED SCRANTON, PA. ELEVATION ON QUAD SHEET IS 1341 WHICH WILL BE ASSUMED TO BE AT THE SPILLWAY CREST.

t_p = SYNDERS BASIN LAGTIME TO PEAK IN HOURS

$t_p = C_t (L L_{CA})^{0.3}$

$= 1.50 (0.85\ (q/s))^{0.3} = 1.12$ hours

RESERVOIR CAPACITY:

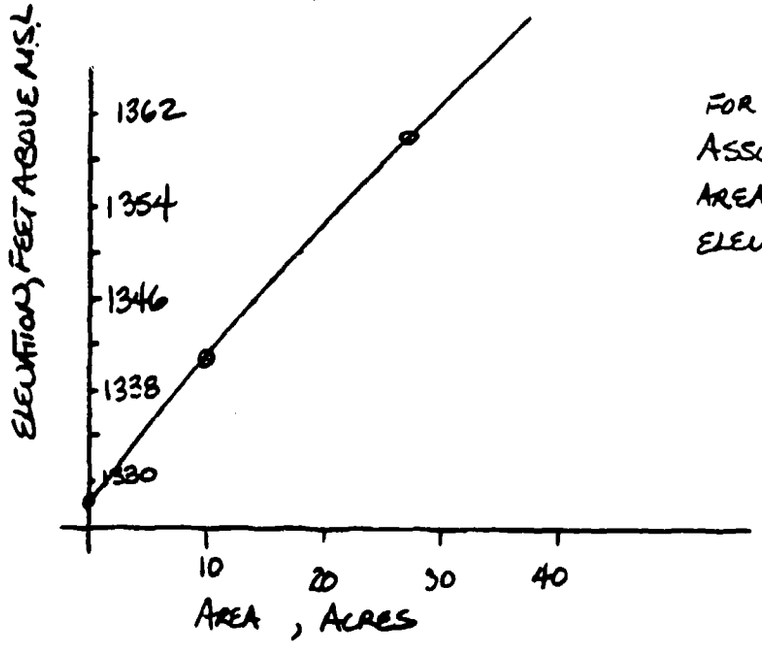
- SURFACE AREA AT SPILLWAY CREST (1341.0) - 10 ACRES
- SURFACE AREA AT ELEVATION 1360.0 - 27 ACRES

ASSUME CONICAL METHOD APPLIES TO FIND LOW POINT IN POOL, BELOW NORMAL POOL.

VOLUME AT SPILLWAY CREST - 43 AC-FT.
(FROM DER FILES)

$V = \frac{1}{3} AH$; $H = \frac{3V}{A} = 3 \left(\frac{43 \text{ AC FT}}{10 \text{ AC}} \right) = 12.9$ FT.

ZERO STORAGE AT $1341.0 - 12.9 = 1328.1$



FOR FLOOD ROUTING PURPOSES ASSUME THE AVERAGE END AREA METHOD IS SUITABLE TO ELEVATIONS ABOVE NORMAL POOL.

$\therefore \Delta V = \left(\frac{A_1 + A_2}{2} \right) \Delta H$

BADS FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS INTERLAKEN DAM SHEET 3 OF SHEETS

COMPUTED BY JPB CHECKED BY DATE 4-13-81

ELEVATION - STORAGE TABLE

ELEVATION (MSL)	AREA (AC)	ΔH (FT)	$\Delta V = \frac{(A_1+A_2)}{2}\Delta H$ (AC-FT)	CUMULATIVE VOLUME (AC-FT)
1328.1	=	=		0
1339.7	=	=	39.0	39.0
1341.0	10		4.0	43.0
1342.0	10.5	1.0	10.25	53.25
1343.0	11	1.0	10.75	64.0
1344.0	12	1.0	11.5	75.5
1345.0	13	1.0	12.5	88.0
1346.0	14	1.0	13.5	101.5
1347.0	15	1.0	14.5	116.0
1348.0	16	1.0	15.5	131.5
1349.0	17	1.0	16.5	148.0
1350.0	18	1.0	17.5	165.5
1360.0	27	10.0	225.0	390.5

NOTE: DRAINAGE AREA ABOVE DAMSITE IS 0.40 mi^2

ELEVATION (MSL)	STORAGE (AC-FT)	
1328.1	0	
1339.7	39	
1341.0	43	
1342.0	53	
1343.0	64	
1344.0	75	
1345.0	88	
1347.0	120	*
1349.0	150	*
1350.0	170	*
1360.0	390	*

* NUMBERS OVER 100 AC-FT, ROUNDED TO NEAREST 10 AC-FT.

NADB FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS INTERLAKEN DAM SHEET 1 OF SHEETS

COMPUTED BY JPB CHECKED BY DATE 4-13-81

SDF: BASED ON THE SMALL HEIGHT OF DAM AND THE SMALL STORAGE, THE SDF SELECTED FOR THE POND WAS THE 100 YEAR FLOOD. THIS IS IN ACCORDANCE WITH THE GUIDENCE PROVIDED.

∴ USE SDF = 100 YEAR FLOOD

PMP CALCULATIONS:

SINCE THE SDF SELECTED FOR THIS POND HAS BEEN THE 100 YEAR FLOOD, NO CALCULATIONS ARE NECESSARY TO COMPUTE THE PROBABLE MAXIMUM PRECIPATATION (PMP) OR PROBABLE MAXIMUM FLOOD (PMF).

NAEG FORM 1132, 20 MAR 74

EMERGENCY SPILLWAY CAPACITY:

NOTE: SPILLWAY IS LOCATED IN CENTER OF EMBANKMENT. SEE FIELD SKETCH IN APPENDIX A, EXHIBIT 1.

SPILLWAY DATA:

TYPE - RECTANGULAR BROAD-CRESTED WEIR.

LENGTH - 30 FEET

CREST ELEVATION - 1341.0 M.S.L.

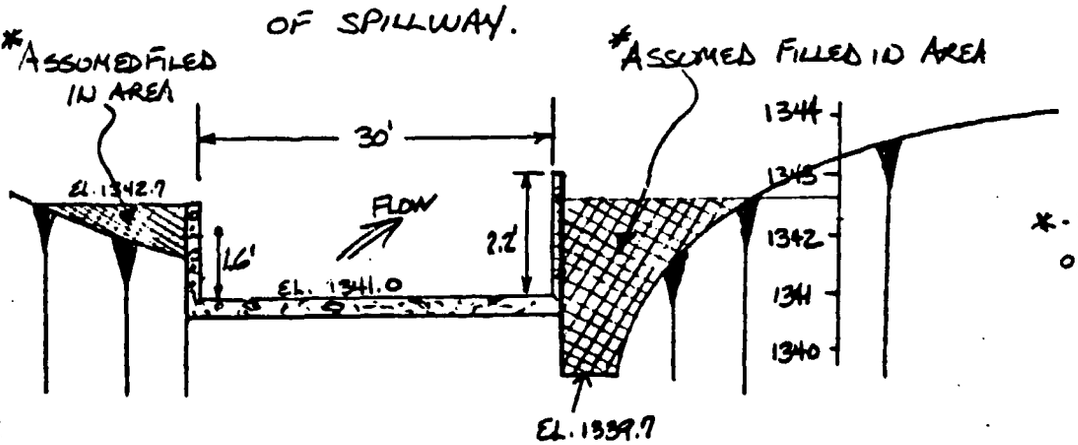
C VALUE: SPILLWAY - 2.85
EMBANKMENT - 2.85

LOW POINT TOP OF DAM - 1339.7 (EXISTING)
1342.7 (ASSUME FILLED IN TO TOP OF SPILLWAY WALL)

NOTE: C VALUES ARE BASED ON WIDTH PARALLEL TO FLOW, THESE VALUES WILL BE HELD CONSTANT FOR ALL HEADS.

SPILLWAY SKETCH:

SEE PHOTOGRAPHS IN APPENDIX C FOR DETAILED EVALUATION OF SPILLWAY.



NOTE: UNDER EXISTING CONDITIONS THE BREACH AREA IS DOWN TO ELEVATION 1339.7. THIS ELEVATION IS 1.3 FEET BELOW SPILLWAY CREST.

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE

SUBJECT DAM SAFETY ANAYSIS

COMPUTATIONS INTERLAKEN DAM SHEET 6 OF SHEETS

COMPUTED BY JPB CHECKED BY DATE 4-14-81

BROAD CRESTED WEIR:

SPILLWAY BEHAVES AS A BROAD-CRESTED WEIR
DISCHARGE CAN BE ESTIMATED BY:

$Q = C L_1 H_1^{3/2}$ where $C = 2.85$
$L_1 = 30$ FEET
H = head on weir

POOL ELEVATION (MSL)	H (FT)	Q (CFS)	ROUNDED Q (CFS)
1341.0	0	0	0
1342.0	1.0	85.5	90
1342.7 *	1.7	169.5	190
1343.0	2.0	241.8	240
1344.0	3.0	444.3	440
1345.0	4.0	684.0	680
1346.0	5.0	955.9	960
1347.0	6.0	1256.6	1260
1348.0	7.0	1583.5	1580
1349.0	8.0	1934.6	1930
1350.0	9.0	2308.5	2310

* - TOP OF DAM - ASSUMING BREACH AND LOW AREA FILLED IN.

BADS FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE _____

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS INTERLAKEN DAM SHEET 7 OF _____ SHEETS

COMPUTED BY JPB CHECKED BY _____ DATE 4-14-81

EMBANKMENT RATING TABLE: (ASSUME LOW AREAS FILLED IN

THIS ANALYSIS ASSUMES THAT THE EMBANKMENT BEHAVES A A BROAD CRESTED WEIR IF OVERTOPPING OCCURS. THIS DISCHARGE CAN BE ESTIMATED BY:

$$Q = C L_1 H_w^{3/2}$$

WHERE: Q = DISCHARGE OVER EMBANKMENT, IN CFS
L_1 = LENGTH OF EMBANKMENT, IN CFS
H_w = WEIGHTED HEAD, IN FEET, AVERAGE FLOW AREA
C = COEFFICIENT OF DISCHARGE

LENGTH OF EMBANKMENT INUNDATED VS. RESERVOIR ELEVATION:

RESERVOIR ELEVATION (MSL)	EMBANKMENT LENGTH (ft)
1342.7 (ASSUMED TOE)	0
1343.0	26
1344.0	202
1345.0	360
1346.0	395
1347.0	395
1348.0	395
1349.0	395
1350.0	395

* MAXIMUM LENGTH OF EMBANKMENT = 395 FT.

NADB FORM 1232, 28 MAR 74

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS INTERLAKEN DAM SHEET 8 OF SHEETS

COMPUTED BY JMB CHECKED BY DATE 4-14-81

EMBANKMENT RATING TABLE: (ASSUME BREACH AND LOW AREA IS FILLED IN)

RESERVOIR ELEVATION (MSL)	L_1 (FT)	L_2 (FT)	INCREMENTAL HEAD, H_i (FT)	① INCREMENTAL FLOW AREA, A_i (FT^2)	TOTAL FLOW AREA, A_T (FT^2)	② WEIGHTED HEAD, H_W (FT)	③ Q
1342.7	0	-	—	—	—	—	C
1343.0	26	0	0.3	3.9	3.9	0.15	4.
1344.0	202	26	1.0	114.0	117.9	0.58	254.
1345.0	380	202	1.0	291.0	408.9	1.08	1215.
1346.0	395	380	1.0	387.5	796.4	2.02	323
1347.0	395	395	1.0	395	1191.4	3.02	59
1348.0	395	395	1.0	395	1586.4	4.02	907
1349.0	395	395	1.0	395	1981.4	5.02	124
1350.0	395	395	1.0	395	2376.4	6.02	1662

① $A_i = H_i [(L_1+L_2)/2]$; ② - $H_W = A_T/L_1$; ③ $Q = CL_1 H_W^{3/2}$

TOTAL FACILITY RATING CURVE: (ASSUME BREACH AND LOW AREA IS FILLED IN)

ROUNDED Q

RESERVOIR ELEVATION (MSL)	$Q_{SPILLWAY}$ (CFS)	$Q_{EMBANKMENT}$ (CFS)	Q_{TOTAL} (CFS)
1341.0	0	0	0
1342.0	90	0	90
1342.7 (ASSUMED TOP)	190	0	190
1343.0	240	10	250
1344.0	440	250	690
1345.0	680	1220	1900
1346.0	960	3230	4190
1347.0	1260	5910	7170
1348.0	1580	9070	10650
1349.0	1930	12660	14590
1350.0	2310	16630	18940

NADB FORM 1232, 28 MAR 74

100 YEAR FLOOD ANALYSIS:

THE SELECTED SDF FOR INTERLAKEN DAM HAS BEEN THE 100 YEAR FLOOD. THIS IS BASED ON THE SIZE OF THE DAM AND THE HAZARD CATAGOREY OF THE DAM.

TO DEVELOP THE 100 YEAR FLOOD, TWO REGRESSION EQUATIONS WILL BE USED TO DETERMINE THE PEAK VALUE. THE AVERAGE OF THE TWO REGRESSION PEAKS WILL BE THE 100 YEAR FLOOD PEAK USED IN THIS ANALYSIS.

BULLENTIN 13 FLOOD PEAK

FROM PLATE 1 - INTERLAKEN DAM IS IN REGION 2.

$\therefore$ REGRESSION EQUATION IS = $Q_T = CA^X$

where:

Q_T = PEAK FLOW FOR RETURN PERIOD T, IN YEARS
C = REGRESSION CONSTANT
A = DRAINAGE AREA IN SQUARE MILES
X = REGRESSION COEFFICIENT

FOR 100 YEAR ANALYSIS:

$T = 100$ $A = 0.40$
$C = 564$ $X = 0.744$

$\therefore Q_{100} = CA^X = 564(0.40)^{0.744} = 285.2$

$\therefore Q_{100} = 285$ CFS FROM BULLENTIN 13

NOW, COMPUTE THE 100 YEAR FLOOD PEAK FROM HYDROLOGY STUDY - TROPICAL STORM AGNES, NORTH ATLANTIC DIVISION, 1975.

$$\text{Log}(Q_m) = C_m + 0.75 \log(A)$$

where: C_m = a map coefficient for mean log of ANNUAL PEAKS
Q_m = geometric mean of annual flood peaks, in CFS
A = drainage area in square miles

FROM FIGURE 21 $C_m = 2.11$

$\therefore \text{Log}(Q_m) = 2.11 + 0.75 \log(0.40) = \underline{1.8115}$

now, compute the standard deviation

$$S = C_S - 0.05 \log(A)$$

where: S = standard deviation
C_S = a map coefficient for standard deviation

FROM FIGURE 22 $C_S = 0.36$

$$S = 0.36 - 0.05 \log(0.40)$$

$$S = \underline{0.3799}$$

now compute the 100 year flood peak from the following

$$\log(Q_p) = \log(Q_m) + K(P,g)\,S$$

where:

$\log(Q_p)$ = log of annual flood peaks for a given EXCEEDENCE FREQUENCY

$\log(Q_m)$ = mean logarithm of annual flood peaks

$K(P,g)$ = STANDARD DEVIATE FOR A GIVEN EXCEEDENCE FREQUENCY (P) AND SKEW COEFFICIENT (g)

S = STANDARD DEVIATION, LOGS OF ANNUAL PEAKS

$\therefore$ WE need to have SKEW coefficient, FROM FIGURE 23

$g = 0.40$

$K(P,g) = 2.62$

$$\text{Log}(Q_{P,}) = \text{Log}(q_m) + K(P,g)S$$

$$\text{Log}(Q_{100}) = 1.8115 + 2.62(0.3799)$$

$$= 2.8068$$

$$Q_{100} = 640.9$$

THEREFORE, $Q_{100} \simeq 640$ CFS FROM TROPICAL STORM AGNES REPORT, NORTH ATLANTIC DIVISION

NOW, COMPUTE THE 100 YEAR FLOOD PEAK BY AVERAGING THE TWO REGRESSION EQUATIONS.

$$\therefore Q_{100} = \frac{285+640}{2} = 462.5 \text{ CFS}$$

Let $Q_{100} \simeq 460$ CFS

SPILLWAY ADEQUACY:

THE SPILLWAY IS CONSIDERED ADEQUATE IF THE MAXIMUM OUTFLOW THROUGH THE SPILLWAY AT LOW POINT TOP OF DAM IS GREATER THAN THE Q_{100} PEAK CALCULATED ABOVE.

THEREFORE,

MAXIMUM OUTFLOW AT TOP OF DAM = 190 CFS
MAXIMUM INFLOW FOR 100 YEAR FLOOD = 460 CFS

SINCE, THE MAXIMUM INFLOW IS GREATER THAN THE MAXIMUM OUTFLOW, THE SPILLWAY IS RATED INADEQUATE.

BALTIMORE DISTRICT, CORPS OF ENGINEERS PAGE _____

SUBJECT DAM SAFETY ANALYSIS

COMPUTATIONS INTERLAKEN DAM SHEET 12 OF _____ SHEETS

COMPUTED BY JPB CHECKED BY _____ DATE 5-28-81

OUTLET WORKS:

THE OUTLET WORKS AT INTERLAKEN DAM HAS BEEN OPERATED TO DRAWDOWN THE LAKE. THE UPSTREAM AND DOWNSTREAM INVERTS ARE UNKNOWN. THE LENGTH AND SLOPE OF THE PIPE ARE ALSO UNKNOWN. THE VALVE STEM WAS LOCATED AND FLOW WAS EMERGING DOWNSTREAM IN THE VICINITY OF A SMALL COLLAPSED PORTION OF THE ROADWAY IMMEDIATELY DOWNSTREAM OF THE EMBANKMENT.

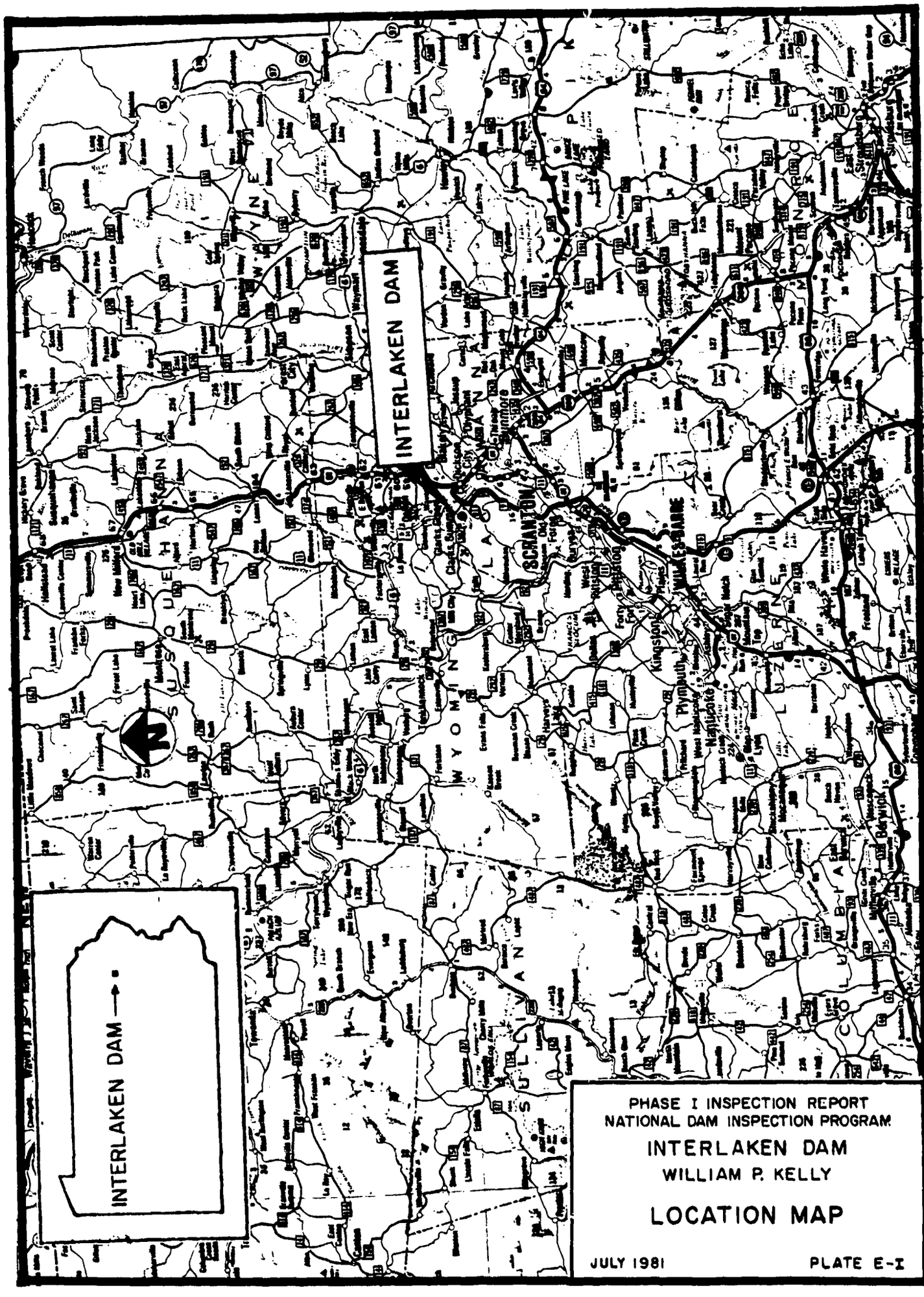
DESIGN DRAWINGS INDICATED AN 8 INCH LINE IN A DIFFERENT LOCATION THEN FOUND BY LOCATING THE VALVE STEM IN THE FIELD. THEREFORE,

DISCHARGE CAPACITY AT MAXIMUM POOL COULD NOT BE DETERMINED.

NADB FORM 1232, 28 MAR 74

APPENDIX E

PLATES



PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

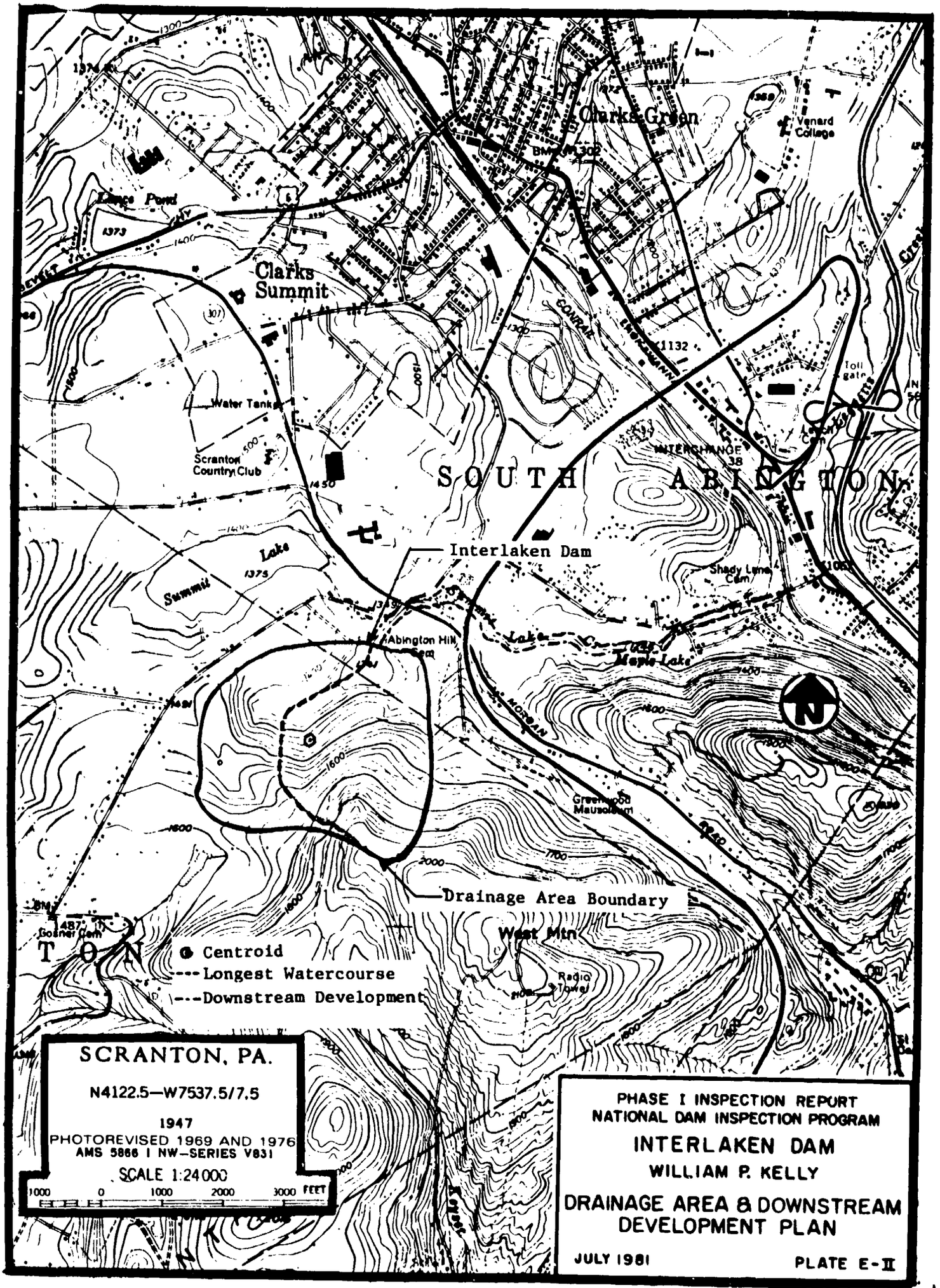
INTERLAKEN DAM

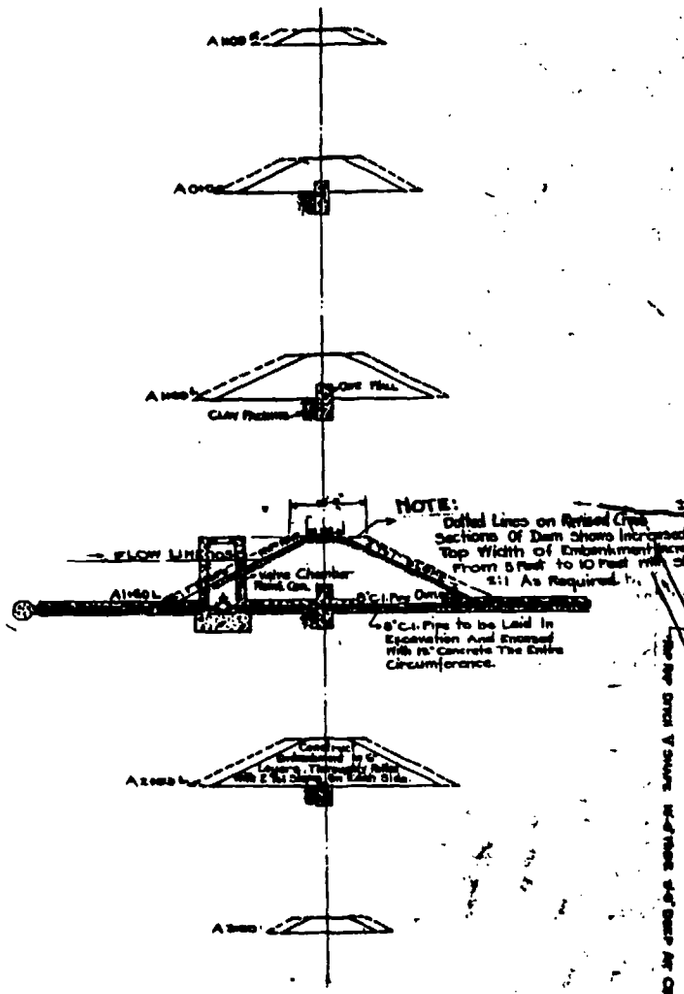
WILLIAM P. KELLY

LOCATION MAP

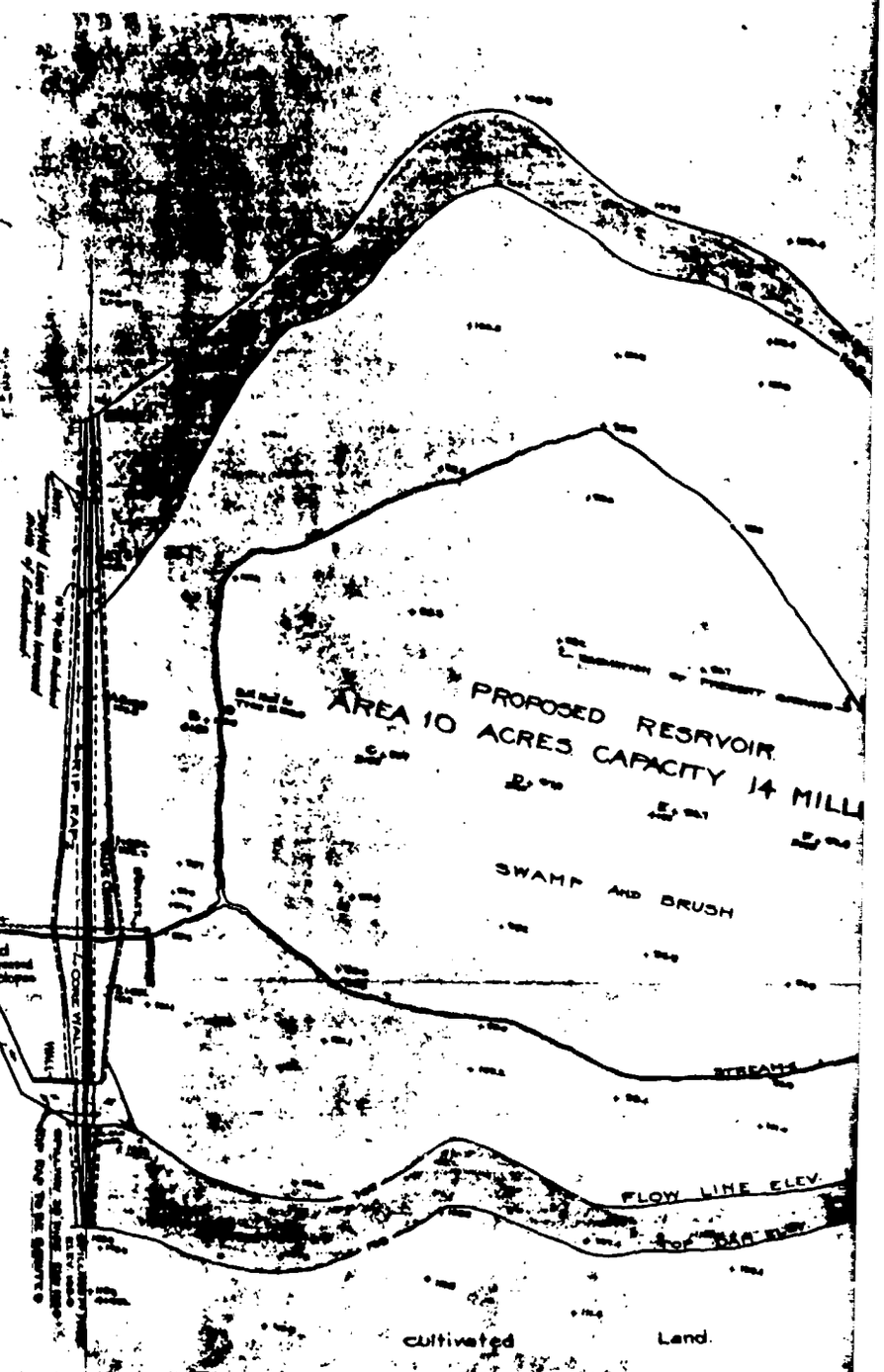
JULY 1981

PLATE E-I


Clarks Green
Venard College
Lange Pond
Clarks Summit
Water Tanks
Scranton Country Club
SOUTH ABINGTON
INTERCHANGE 38
Toll gate
Interlaken Dam
Lake Summit
Shady Lane Cem
Abington Hill Cem
Maple Lake
Greenwood Mausoleum
Drainage Area Boundary
West Mtn
Radio Tower
T O N
Centroid
Longest Watercourse
Downstream Development
SCRANTON, PA.
N4122.5—W7537.5/7.5
1947
PHOTOREVISED 1969 AND 1976
AMS 5866 I NW—SERIES V831
SCALE 1:24000
1000 0 1000 2000 3000 FEET
PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
INTERLAKEN DAM
WILLIAM P. KELLY
DRAINAGE AREA & DOWNSTREAM DEVELOPMENT PLAN
JULY 1981
PLATE E-II



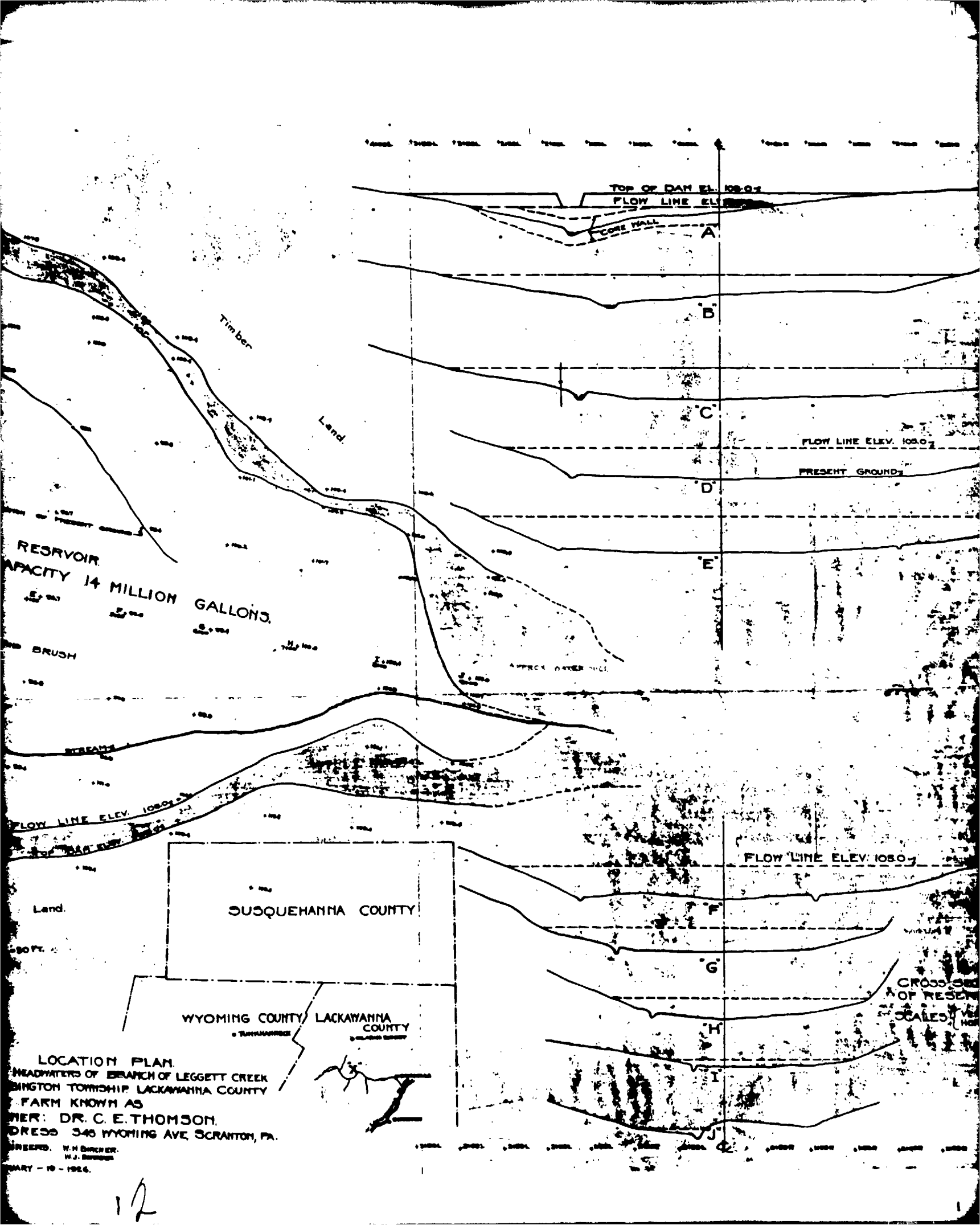
CROSS SECTIONS OF DAM.
SCALE 1"=10'.



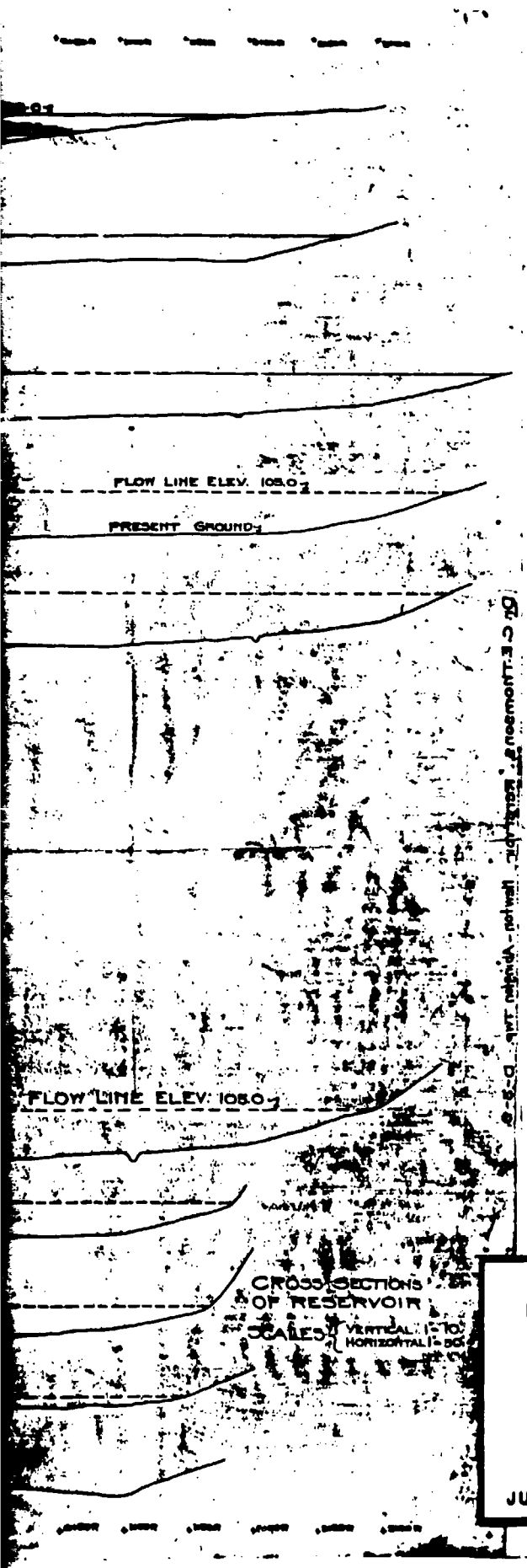
PLAN OF RESERVOIR SCALE 1 IN.=50 FT.

NOTE: PLAN REVISED FEBRUARY, 1926.

LOCATION
"X" HEADWATERS OF
NEWTON & ABINGTON TOWNSHIP
ON THE FARM KNOWN AS
OWNER: DR. C. E. T
ADDRESS 346 WYOMI
ENGINEERS. W. H. BIRKINBINE.
W. J.
JANUARY - 19 - 1926.


TOP OF DAM EL. 108.0
FLOW LINE EL
CORE WALL
A
B
C
FLOW LINE ELEV. 105.0
PRESENT GROUND
D
E
F
G
H
I
J
FLOW LINE ELEV. 105.0
Timber
Land.
RESRVOIR
APACITY 14 MILLION GALLONS.
BRUSH
STREAM
FLOW LINE ELEV. 105.0
Land.
SUSQUEHANNA COUNTY
WYOMING COUNTY
LACKAWANNA COUNTY
LOCATION PLAN.
HEADWATERS OF BRANCH OF LEGGETT CREEK
SINGTON TOWNSHIP LACKAWANNA COUNTY
FARM KNOWN AS
NER: DR. C. E. THOMSON.
DRESS 346 WYOMING AVE, SCRANTON, PA.
SIGNED. W. H. BANCKER.
W. J.
MARY - 19 - 1926.
CROSS SEC
OF RESER
SCALES:

12



PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

INTERLAKEN DAM

WILLIAM P. KELLY

JULY 1981 PLATE E-III

APPENDIX F

GEOLOGY

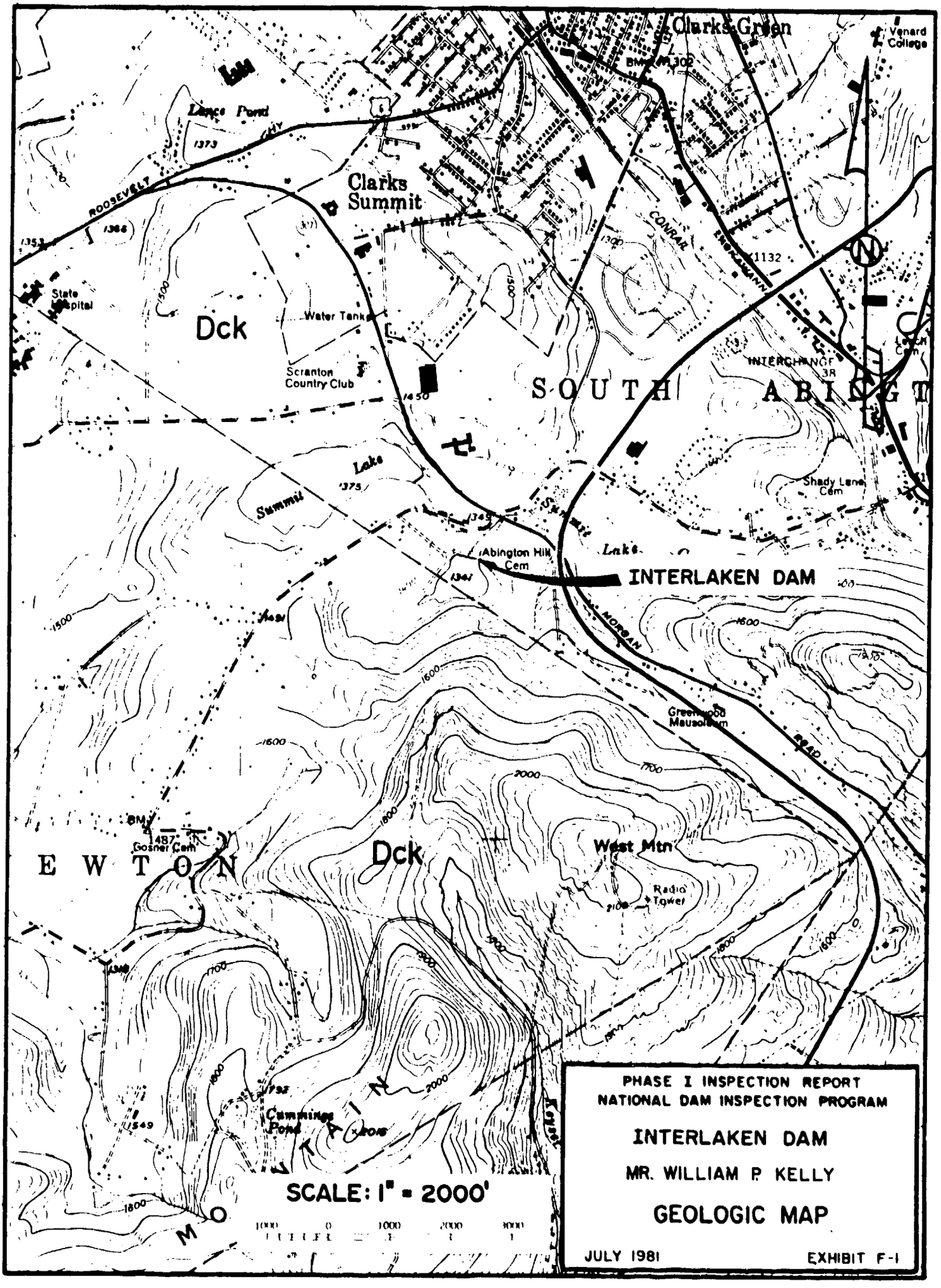
GENERAL GEOLOGY

Bedrock at Interlaken Dam is gray to red siltstone and shale of the Catskill Formation. It is well bedded in thin to medium beds with closely spaced, well developed joints. Siltstone is moderately resistant to weathering and breaking along joints into tabular and blocky fragments. Glacial till is probably thin at this site.

Legend

(Bedrock)

Dck CATSKILL FORMATION UNDIVIDED - Succession of grayish - red sandstone, siltstone, and shale, generally in fining - upward cycles; some gray sandstone and conglomerate.


Clarks Green
Venard College
Lake
Lance Pond
ROOSEVELT
Clarks Summit
CONRAIL
INTERCHANGE 3R
State Hospital
Water Tank
Dck
Scranton Country Club
SOUTH ABINGTON
Lake Summit
Shady Lane Cem
Abington Hill Cem
INTERLAKEN DAM
MORGAN
Greenwood Mausoleum
ROAD
BM
Gosner Cem
EWTON
Dck
West Mtn
Radio Tower
Cummings Pond
SCALE: 1" = 2000'
PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
INTERLAKEN DAM
MR. WILLIAM P. KELLY
GEOLOGIC MAP
JULY 1981
EXHIBIT F-1